

Smart Medical Technologies

S U M M I T 2004

Discovering Tomorrow's Solutions Today



Event Announcement

Updated 02/11/04

Check for updates on the event homepage: <http://advtech.jsc.nasa.gov/smt04.asp>

Overview

Who:	Approximately 100 medical technology developers and users from NASA, the military, other government agencies /laboratories, and academia
What:	A small-scale, technology-focused event geared to future solutions for emergency medical situations in space exploration, the military, and the urban community
Where:	Houston, Texas
When:	April 7-8, 2004
Why:	To share needs and solutions with those who have interests in emergency medical technologies while providing an environment for education, networking and collaborations
How:	Participants and speakers do NOT pay any registration fee! But we do NOT have funds to defray travel, hotel, or meal costs. Simply complete the online participant or speaker request form to request your invitation

Objectives

The Advanced Technology Integration Group (ATIG) at NASA /Johnson Space Center (JSC) and its co-chair the National Technology Transfer Center's (NTTC) Emergency Response Technology Program (ERTP) are proud to announce the upcoming event *Smart Medical Technologies (SMT) 2004*. Smart medical technologies are those technologies, artificial intelligence, or innovations that improve the success of emergency medical procedures performed in remote, hostile, or otherwise challenging environments.

As with past events, this technology-focused event will focus on providing attendees with highly informative presentations and valuable networking opportunities. We seek representation from across the medical technology community. We will be establishing a schedule of quality speakers and a roster of eager participants who are currently working in areas of health/medical informatics, artificial intelligent technologies, and beyond.

This event will focus on the technology needs and requirements of NASA, military, and academia. Through two days of presentation sessions, we aspire that collaborations are born and nurtured. By targeting an audience with special interest in emergency medical technologies, we ensure that SMT 2004 will generate intelligent discussions and possible technology solutions for individual and common needs.

We are proud to have a record of highly successful technology-focused events that began with Human Operations in 2001. These events have enjoyed such success because of their unique structure. SMT 2004 will not be not like large-scale conferences. Smart Medical Technologies 2004 will be a small-scale, invitation-only, and tightly focused event. Our main objectives are to bring highly qualified information to the smart medical community and to catalyze networking opportunities.

Setting the Stage for Smart Medical Technologies

NASA is a collection of flight and research centers across the United States that together holds the responsibility for America's space flight program. NASA technologies not only improve the safety and success of the space exploration program, but they also improve life here on Earth for all.

The Johnson Space Center (JSC) has a very important role in the NASA family. It is the operational center where astronauts work and are trained and where human space flight missions are controlled. A small, but active part of at JSC is the Advanced Technology Integration Group (ATIG) within the Space and Life

Sciences Directorate. The purpose of the ATIG is to encourage collaborations between technology developers from NASA, academia, and military. Through these symposia, ATIG invites experts from the areas of other NASA centers/laboratories, academia, and military to present, network, and possibly form collaborations in particular areas of technology needs.

Why are we so interested in smart medical technologies? Space exploration is an unusual and hostile environment. The human body, both physically and psychologically, goes through significant changes during a mission. Even though astronauts receive thorough and intensive training over many years, there is no way to prepare the crew for every contingency.

During a mission there may be a crew of seven with expertise ranging from space scientist to physician. Crewmembers are well-trained in their areas of expertise, and as a team they are able to complete their mission successfully. But what if something unexpected happened to one of the most important crewmembers, the Crew Medical Officer?

A Hypothetical Scenario

The nation is very excited. It is the first long term space expedition for the United States- our first journey to Mars. The crew has been in flight for six months now. The experiments are going well and the crew is ready for landing. There have not been any serious problems during their journey and everyone seems to be holding up well physically and mentally. But as things go, maybe we spoke too soon.

Mission Control at JSC has just been notified by the Mars mission crew that there is an uncontrollable fire outside of one of the crewmember's sleeping quarters and some of the crewmembers are trapped. The other crewmembers, who are not trapped, control and put out the fire; unfortunately, the smoke begins to overtake the module and one crewmembers passes out from smoke inhalation. To further confound the situation, the affected crewmember is the only physician aboard the spacecraft. No one panics: the remaining crewmembers immediately attempt to notify Mission Control of the status but due to the location of the space craft, there is 40 minute round- trip communication delay. They have entered into a zone where there may be no communication for 10 -15 minutes and the only person with medical knowledge is unconscious. Everyone is aware of how critical time is in medical situations such as this. With no trained physician available and no help from Mission Control, what are they to do?

If a situation were to occur such as the one described above, imagine the value of having some type of technology or smart robotic system that could assist the non-physician crewmembers in stabilizing the injured astronaut. This illustrates why the development of smart medical technologies is so important. The judicious use of technology is very important to the success and safety of the space flight program.

And such smart medical systems will not only improve the space program, but also help life on Earth— such as the military and homeland security. This is why research and development into smart medical technologies must be the focus of a dedicated community of technologists: they can help to improve the emergency medical response in every environment, from spacecraft to ambulance and submarine to civilian airport.

Registration

Due to the limited seating in the facility and a focus on valuable networking, *SMT 2004* is invitation-only. Request your invitation via the form on the event homepage:

<http://advtech.jsc.nasa.gov/forms/forms.asp>

We may not be able to extend an invitation to everyone who registers, so please look for a confirmation once you have submitted your request.

Who Should Attend

The event facility allows for 100 participants. So we seek approximately equal representation from:

- ➡ NASA,
- ➡ the military and other government agencies, and
- ➡ academic researchers and technology developers.

We encourage technology developers and users who are currently working in fields related to emergency medical technologies to participate; those performing interdisciplinary research and development often have much to contribute. Students in health/medical informatics, artificial intelligence, or other related disciplines and who are considering a career in this field are invited to participate.

Travel Plans

Our events emphasize learning and interaction, which can only take place if we have strong representation from relevant communities. We make every effort to announce events and to invite key players. But in the event that participant or speaker response is low, we reserve the right to cancel or change the date of an

event. We recognize that travel plans must be made in advance, so any changes will be made no less than 30 days before the event.

Confirmed participants and speakers will receive a detailed *Information Pack* to help them plan travel and accommodations

Speakers

We are now accepting requests to present at the *SMT 2004* event. Each presentation should last no more than 30 minutes and may include discussion time at the speaker's discretion. *Smart Medical Technologies 2004* will include three types of presentations that describe:

- ➡ a specific government technology program or project,
- ➡ a relative technology or capability, especially if it has multiple applications, or
- ➡ a broad summary of technologies in a relevant area

While new and emerging technologies are of greatest interest, all speakers who have a solution in this area are encouraged to present. Often, existing technologies have not yet been applied to current problems.

When describing smart medical technologies, we want to include areas of study, but not limited to, health/medical informatics and artificial intelligence, but focusing on the use of these technologies to improve the results of saving lives in time- critical emergency situations. ATIG's goal is to provide the audience with unique and innovative technology concepts and the opportunity to form collaborations that will aide in an emergency response situation, whether it is in the urban environment, the battlefield, or in space flight. We want to make sure that the presentations will include different technologies that are on the cutting edge: technologies that are not on the shelf, but are being researched and developed. Some examples of technology that we are interested in includes, but is not limited to the following:

- ➡ *Visual programming shells/interfaces that allow physicians and other medical experts to easily capture their knowledge for diagnostic aids, decision support tools, medical protocol control, multimedia training tools, and other support systems.*
- ➡ *Methods of coordinating the activities of teams, such as control through RF linked palmtop computers or other means, to ensure adequate emergency medical response.*
- ➡ *Methods for rapidly entering medical records and comparison with existing records for rapid diagnostic support, allowing more natural and easier ways of interacting with or accessing medical knowledge in the context of real data.*
- ➡ *Medical data visualization techniques that provide large quantities of complex data in easy to understand and manipulate forms, allowing questions about the data to be easily and intuitively investigated in an interactive fashion.*

- ➡ *The use of physiological simulation models to aid in protocol and procedure development for emergency medical response.*
- ➡ *The use of detailed physiological models of individual patients in decision support to allow prediction of the effect of treatments or the administration of pharmaceuticals for guiding protocol selection in particular cases.*
- ➡ *On-the-spot tools for providing decision support and "just-in-time" training to allow relatively unskilled individuals to perform emergency treatment that they would not otherwise be capable of performing.*
- ➡ *Basic tools for creating intelligent, tutoring applications that can be used to insert medical training into long term missions, especially those that use a multimedia case study approach.*
- ➡ *Novel automated means for delivering various aspects of emergency medical care to free up crew members to take on other tasks.*

Once your request to speak has been submitted, look for a confirmation email and the *Speaker Guidelines*, a short file on planning and submitting your talk.

Where speakers permit it, the audio of presentations will be recorded. Recorded talks from both days will be published online in the *Smart Medical Technologies 2004* presentation archive soon after the event. This allows the widest possible audience to learn from smart medical systems presentations.

Logistics

Due to the nature of this event, *SMT 2004* will be invitation-only. Once you request an invitation to attend or speak, look for a confirmation. Confirmed attendees will receive regular schedule updates and other information. Look for the *SMT 2004 Info Pack*, which includes details on travel, directions, parking, and other logistics.

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